

VISIT...

LANZAROTE
Caliente.COM

The Myth of Quantum Consciousness

Victor J. Stenger, Ph. D.
Department of Philosophy
University of Colorado
Campus Box 232
Boulder, Colorado 80309-0232, USA

Direct correspondence to:

Victor J. Stenger
500 N Bermont St.
Lafayette, CO 80026, USA
E-mail: vstenger@mindspring.com
Phone: 720 890 9655
Fax: 303 492 8386

Draft of July 26, 2002 10:01 am for comment only.

DO NOT DISTRIBUTE

Abstract

The myth of quantum consciousness holds that quantum mechanics provides a scientific basis for ancient notions in which the human mind is connected to a universal consciousness and is able to exert control over the very nature of reality. This is shown to be a misreading of the significance of some interpretations of quantum mechanics. Furthermore, other interpretations exist which suggest no such mystical elements.

Introduction

A new myth is burrowing its way into modern thinking. The notion is spreading that the principles embodied in quantum mechanics imply a central role for the human mind in determining the very nature of the universe.

Quantum mechanics, as a mathematical theory, has proved to be of immense precision and practical utility. Little dispute exists today about the structure of the theory, which has been largely unchanged, only expanded upon, since its inception in the early twentieth century. However, this success is not matched by a consensus on what quantum mechanics means philosophically, that is, what it implies about "ultimate reality." Several interpretations are equally capable of yielding the same empirical results. Since none provides its own unique predictions, this can only mean that all the interpretations of quantum mechanics are equivalent—at least until someone shows us how to improve on one or falsify the others.

Although the various interpretations of quantum mechanics differ in their implications on the nature of physical reality, various metaphysical elements have been

muddled together in a genre of popular literature I call *quantum metaphysics*. This new wrinkle on venerable Eastern and Platonic / Christian mysticism exploits the strong role of the observer in quantum mechanics. Traditional religious myths, East and West, call upon scripture or the utterances of charismatic leaders as their authorities. By contrast, the new mythology is supposedly grounded on up-to-date scientific knowledge.

While the mathematical formulation and methods for the practical application of quantum mechanics have remained largely unchanged and unchallenged for six decades, the deeper philosophical significance of the theory has continued to be debated. On the fringes of this debate we find numerous popular articles and books that promote a stupendous notion: Our egos could be right after all. Humans and human consciousness may indeed constitute the fundamental essence of reality. If you were to judge by the space occupied by this genre on the shelves of popular book stores, you would conclude that it has become mainstream science.

One often hears that, according to quantum mechanics, the properties of material bodies are brought into existence by the very act of their measurement. This certainly clashes with our intuitive notion that the universe possesses an objective reality independent of the observer. Surely, as Einstein insisted, the moon is still there when no one is looking.

But many authors have construed quantum mechanics, with its strict use of operational terms, to imply a central role for the human mind in affecting the very nature of reality itself. Let me give a sampling of some of the expressions of this viewpoint.

Physician Robert Lanza has written that, according to the current quantum mechanical view of reality, “We are all the ephemeral forms of a consciousness greater

than ourselves.” The mind of each human being on earth is instantaneously connected to each other—past, present and future—as “a part of every mind existing in space and time.” In Lanza’s view, quantum mechanics tells us that all human minds are united in one mind and “the entities of the universe—electrons, photons, galaxies, and the like—are floating in a field of mind that cannot be limited within a restricted space or period . . .”(1)

Physicist Fritjof Capra has long been an influential proponent of mystical interpretations of quantum mechanics. He first expressed his ideas in 1975 in *The Tao of Physics*, which drew strained parallels between modern physics and Eastern mysticism.(2) Quantum mechanics, in Capra’s view “reveals the basic oneness of the universe” in a manner that harmonizes with the Hindu notion of *Brahmin*, the “unifying thread in the cosmic web, the ultimate ground of being: ‘He on whom the sky, the earth, and the atmosphere are woven (Mondaka Upanishad, 2.2.5)’ ”

These ideas resonate with the “cosmic consciousness” promoted by Maharishi Mahesh Yogi and his Transcendental Meditation movement. Like Lanza, these sages claim modern physics as their authority. The Maharishi has associated cosmic consciousness with the Grand Unified Field of particle physics.

In Lanza’s interpretation, quantum mechanics tells us that all human minds are united in one mind and “the entities of the universe—electrons, photons, galaxies, and the like—are floating in a field of mind that cannot be limited within a restricted space or period . . .”

These ideas strongly influenced the development of the New Age movement in America during the latter twentieth century. Marilyn Ferguson in her 1980 New Age bible, *The Aquarian Conspiracy*, said that new scientific knowledge has revised “the very

data base on which we have built our assumptions, institutions, our lives.” Promising far more than “the old reductionist view,” the new scientific perspective “reveals a rich, creative, dynamic, interconnected reality.”(3)

Capra was not alone in claiming parallels between the new physics and Eastern mysticism. In *The Dancing Wu Li Masters*, Gary Zukav says physicists “are dancing with Kali, the Divine Mother of Hindu mythology.” Zukav saw the new physics as suggesting that “there really may be no such thing as ‘separate parts’ in our world.”(4)

One of the Maharishi’s disciples, Dr. Deepak Chopra, is perhaps the most successful of a growing group of authors who have appropriated the quantum as the foundation for alternative, non-conventional methods of healing based on the belief that mind can overcome the limitations set by the laws of physics and biology.

Chopra’s 1989 book was entitled *Quantum Healing: Exploring the Frontiers of Mind/Body Medicine*.(5) Another best-seller is called, *Ageless Body, Timeless Mind: The Quantum Alternative to Growing Old*.(6)

In a similar vein, Johns Hopkins University psychiatrist Patricia Newton uses the quantum as basis for what she says is an Afrocentric approach to healing. In a talk presented before a medical conference, Newton said that traditional healers “are able to tap that other realm of negative entropy—that superquantum velocity and frequency of electromagnetic energy and bring them as conduits down to our level. It’s not magic. It’s not mumbo jumbo. You will see the dawn of the 21st century, the new medical quantum physics really distributing these energies and what they are doing.”(7)

I do not deny a certain limited value in the traditional healing methods from many cultures. Surely, over the ages, useful treatments for a host of aches and pains were discovered by trial-and-error. It appears that many of these methods trigger the

well-established placebo effect and perhaps other mechanisms by which the human body heals itself. No doubt Western medicine can improve its methods for treating the “whole person.” I simply wonder what it all has to do with the quantum.

Aether and Spirit

The cosmic mind, viewed from the paranormal perspective, is some sort of invisible field that pervades the universe. Human minds are supposedly linked to this field, able to excite it and receive excitations from it. This is far from a new idea.

As science gradually became established, people sought ways that it might be reconciled with their traditional beliefs, or even used to buttress those beliefs. In the nineteenth century, some scientists associated spiritual or psychic forces with the *aether* that was thought to fill all space and provide the medium for the transmission of light from distant stars. Going beyond physics, these scientists suggested that the aether provided the mechanism by which humans connected to a imagined world beyond matter—the world of the spirit.

The belief in a universal, cosmic fluid pervading space has even older roots. To the ancient Greeks, aether was the rarified air breathed by the gods on Olympus. Aristotle used this term for the celestial element, the stuff of the heavens, and said it was subject to different tendencies than the stuff of earth. That is, aether was not bound by the same laws as ordinary matter.

When Newton was prompted to explain the nature of gravity, he replied that gravity might be transmitted by the invisible aether.⁽⁸⁾ He further suggested that the aether also may be responsible for electricity, magnetism, light, radiant heat, and the

motion of living things that he, like his contemporaries, thought was the consequence of some source beyond inanimate matter.

Today, with knowledge not available to Newton, we can account for life as a purely material phenomenon with no need to invoke any special life-force. Despite this, and the complete absence of scientific support for the existence of immaterial, vital forces, we still hear of ch'i, ki, prana, and psychic energy—usually in association with alternative healing. Again the ego is doing the thinking, assuming that something special must account for the wonder of its own existence.(9)

Newton had envisioned matter and light as particulate in nature, though they appear continuous to the human eye. Gravity, however, seemed to be something else, acting invisibly—holistically—over the entire universe.

In the mid-nineteenth century, the mathematical concept of the field was developed to describe the apparent continuity of matter, light, and gravity. A field has a value at each point in space, in contrast to the properties of a particle which are localized to an infinitesimal region of space.

Pressure and density in a fluid are two examples of how the field concept is successfully applied in practice. Although matter is discontinuous at the atomic and molecular level, these “matter fields” provide for an accurate description of the behavior of solids, liquids, and gases because, on the everyday scale, matter appears continuous to a very good approximation.

As the phenomena of electricity and magnetism became better understood, they also were described in terms of fields. Then, in 1867, James Clerk Maxwell had one of those rare insights that punctuate the history of science. He discovered that the equations uniting electricity with magnetism called for the propagation of

electromagnetic waves in a vacuum, Furthermore, these waves moved at the speed of light.

Waves were already very familiar phenomena in physics. In (apparently) continuous media such as air, pressure and density propagate as sound waves when the media are excited. For Maxwell's electromagnetic waves, the question arose: What's doing the waving? The analogy was drawn that all of space out to the most distant stars was filled with an elastic medium—the aether—whose excitation produced the phenomenon of light.

Electromagnetic waves beyond the narrow spectrum of visible light were predicted, soon observed, and put to use in “wireless telegraphy.” One of the early workers was the English physicist Oliver Lodge. While making major contributions to physics and engineering, Lodge joined William Crookes, Alfred Russel Wallace (co-discoverer of evolution) and other notable nineteenth century scientists in extending their horizons to search for phenomena that transcended the world of matter.

If wireless telegraphy was possible, why not wireless telepathy? If electrical circuits could generate and detect ethereal waves, why not the human brain? Coincidentally, certain people who claimed to possess the ability to communicate with other minds, living and dead, had just appeared on the scene. They were called spiritualist mediums a century ago; today their spiritualist descendants are known as psychics or channellers.

Unfortunately, most scientists lack the specific skills needed to distinguish fact from illusion in the world of magic. The universe does not lie; people lie. And so Lodge and other nineteenth century psychical researchers unwittingly allowed themselves to be fooled by the tricks of professional fortune-tellers and sleight-of-hand artists posing

as spiritualists. They permitted their wishes and dreams to govern their senses and reason. Lodge, desperately wanting to believe in life after death, had written passionately about imagined communications with his son Raymond, killed in Flanders in 1915. Sadly, he accepted the wildest claims of mediums and skilled stage magicians.

The search for psychic phenomena in the lab was carried on throughout the twentieth century, a key figure being Joseph Banks Rhine at Duke University. Although Rhine and others made many claims for the detection of *extrasensory perception (ESP)*, *psychokinesis (PK)*, and other forms of special powers of the mind, none held up under the light of critical scientific scrutiny. One still hears claims today that ESP and PK are empirically established facts. However, none of these claims stand up under the same scrutiny as is applied to claims of extraordinary phenomena in other field such as physics. In field, the field continues to be marked by poor experimental design, incorrect statistical analysis, and absence of replication.(10)

Relativity and Quantum Mechanics

Near the turn of the century, Michelson and Morley sought to find experimental evidence for the electromagnetic, or “luminiferous,” aether and succeeded in showing instead that it did not appear to exist. Shortly thereafter, in 1905, Einstein developed his theory of relativity which demonstrated that the concept of an aether was mathematically and logically inconsistent with Maxwell’s equations of electromagnetism. Einstein concluded that electromagnetic waves, including light, could not be the vibrations of an aether. Still, Oliver Lodge remained firm in his belief that a universal cosmic fluid existed that could be excited by the human mind. To Lodge, the

aether was a necessity, the cosmic glue without which “there can hardly be a material universe at all.”(11)

Lodge was similarly unhappy with what he was hearing quantum physicists, like Planck and Bohr, say about the fundamentally discrete, quantized, nature of all phenomena. He deplored “the modern tendency . . . to emphasize the discontinuous or atomic character of everything.”(12) But progress passed him by, as evidence accumulated that matter is composed of discrete atoms, that electricity is the flow of electrons, and that light is a current of particles called photons.

By the time Lodge died in 1940, both the luminiferous aether and material continuity were already long in their graves. Today the electromagnetic aether is no longer a candidate for the stuff of spirit. The aether simply does not exist. In its place, even more ephemeral aether fields have been imagined as sources for spiritual quintessence—the field of the quantum wave function, the “quantum potential,” or perhaps, as Danah Zohar suggests, the vacuum itself.(13)

Like Lodge, Ernst Mach, and many other capable physicists of the early century, Einstein was uncomfortable with quantum mechanics, calling it “spooky.” In 1935, he and two collaborators, Boris Podolsky and Nathan Rosen, wrote a paper arguing that quantum mechanics was incomplete because it does not provide for a description of what they called “physical reality.”(14)

Einstein and his collaborators pointed out that, following conventional quantum mechanics, an experiment performed at one point in space seems to immediately determine the outcome of another experiment performed at a different point, even when the separation between these points is such as to require a signal moving faster than light to carry information from one to the other in the elapsed time interval. In

fact, a signal must move at infinite speed to connect two simultaneous events separated any distance, even one as small as an atomic diameter. This distance could also be billions of light years, if all events past and future are to be connected.

Yet quantum mechanics seems to allow for just such an instantaneous correlation between separated events. This has provided a scientific basis, at least in some minds, for the notion that the universe is one simultaneously-connected whole. Einstein referred to this quantum connectivity as a “spooky action at a distance,” noting that it was incompatible with his claim that no signals can move faster than light.

Like so many of the strange effects of quantum mechanics, this apparent paradox is a consequence of the wave-particle duality in which physical systems seem to behave either like waves or particles, depending on which type of property you are trying to measure. Again the distinction is between the discrete, localized properties of a particle and the continuous, distributed properties of a wave field.

Now it is not commonly appreciated that instantaneous correlations between separated events were already present in pre-relativistic, pre-quantum physics. Prior to Einstein, no limit on the speeds of bodies was known to exist. Furthermore, classical waves, even those moving at finite speed that you stimulate by tossing a pebble in a lake, can produce correlations between separated phenomena. You can imagine such a wave carrying information in the modulation of its amplitude or frequency, just as with sound and radio waves.

As a radio wave propagates outward, all the information carried by the waveform spreads through space. At any given time, two separated receivers on the wave front obtain that identical information; they simultaneously hear the same program. The two receivers can be said to be correlated, but that relationship is not a

causal one in which an action at the place of one receiver generates a result at the place of the other receiver. Observers at the receiver positions cannot instantaneously signal each other unless that signal can move at infinite speed.

So, independent of quantum mechanics, observations at separated points in space can still be correlated. This correlation, however, does not imply superluminal signalling nor any other miracle; no physical law is violated. Two points in space can receive the same information when that information originates from the same point.

Quantum mechanics, on the other hand, has suggested to some that measurements made at one point in space can instantaneously affect the outcome of measurements at another point. This notion is termed *nonlocality*. It implies some sort of superluminal signalling, in violation of Einstein's assertion that nothing can go faster than light. The consequences of nonlocal communication are so profound as to turn most of our concepts of space and time on their heads. Indeed, the realization by Einstein that motions at infinite speed made it impossible to assign points in space and time a unique reality led him to assert that a maximum speed, the speed of light, exists.

In 1964 John S. Bell, stimulated by the ideas of David Bohm, showed how it was possible to experimentally test the spooky way quantum mechanics seemed to allow for superluminal action at a distance.⁽¹⁵⁾ Bohm, following a largely forgotten suggestion of de Broglie a quarter century earlier, had proposed an alternative interpretation of quantum mechanics in which yet-undetected entities were responsible for the wave-like behavior of particles.⁽¹⁶⁾ Following convention, I will call these entities *hidden variables*, though the term is not particularly enlightening.

Bell showed the way to experimentally decide between the most important class of hidden variables, those that are both “local” and “real” as are the variables of

classical physics, and the conventional interpretation of quantum mechanics. *Local* variables do not violate Einstein's relativity and involve no superluminal signalling. *Real* variables, in this context, are like the familiar variables of classical physics, being simultaneously measurable and behaving in predictable ways.

After a series of precise experiments, the issue was decided: Hidden variables that are both local and real are ruled out.(17) Real, nonlocal hidden variables, such as those introduced by de Broglie and Bohm, remain possible alternatives to the conventional interpretation of quantum mechanics.

But nonlocality implies superluminal connections at some level, and at least an apparent violation of relativity. Since experiment has yet shown any such violation, a more economical interpretation of the results on experimental tests of Bell's theorem is simply that no hidden variables exist. Popular literature would lead you to think that nonlocality is a demonstrated fact of nature. However, nonlocality exists only in some interpretations of quantum mechanics. Other interpretations exist which maintain locality. And most importantly, no superluminal motion or communication has ever been observed.

Experiment, not theory, will decide whether nonlocality is indeed a fact of nature. So far, it is not known to be a fact. Those quantum interpretations that incorporate nonlocality claim, with a certain illogic, that the superluminal transfer of information is still impossible. However, I fail to see how nonlocality can imply anything meaningful other than communication or motion faster than the speed of light.(18)

The New Holism

With experiment ruling out local hidden variables, a new holism has begun to develop. For example, Bohm's nonlocal *quantum potential* seems to imply an interconnectedness between separated phenomena that does not exist in reductionist physics. In the new holism, a revised quantum mechanics provides the mechanism by which signals can move faster than light, making possible the instantaneous connections across the universe.(19)

However, the nonlocality of hidden variables or other variations on nonlocal, causal mechanisms underlying quantum mechanics is a nonlocality within that specific interpretation and not necessarily within quantum mechanics itself as a theory that describes the results of observations.

If the apparent empirical violation of Bell's theorem is to be construed as evidence for nonlocality in nature, which is by no means demonstrated, then that nonlocality is contained in hidden variables or other structures that play no role in quantum mechanics as it is currently practiced. Any theory of hidden variables is thus a new theory, a *sub-quantum* theory that must lie deeper than quantum theory.

This has not discouraged many authors from finding other mystical messages within the conventional Copenhagen interpretation of quantum mechanics. They conclude that we can never adequately describe, in scientific terms, the "irreducible whole." This obscure concept has been related to the "being-in-itself" of that master of obscurity, philosopher Martin Heidegger.

For example, in their book *The Conscious Universe*, astrophysicist Menas Kafatos and philosopher Robert Nadeau associate "being-in-itself" with the quantum wave

function:

“If the universe were, for example, completely described by the wave function . . . One could then conclude that Being, in its physical analogue at least, had been ‘revealed’ in the wave function. We could then assume that any sense we have of profound unity with the cosmos or any sense of mystical oneness with the cosmos, has a direct analogue in physical reality. In other words, this experience of unity with the cosmos could be presumed to correlate with the action of the deterministic wave function which determines not only the locations of quanta on our brain but also the direction in which they are moving.” (20)

However, let me add a cautionary note. The vision of the new holists is not so appealing as it may first appear. The field of cosmic mind, whether aether, wave function, or quantum potential, is completely deterministic. In whatever manifestation, holistic physics possesses the very Newtonian, mechanistic character that is so decried by New Age authors.

In the view of quantum holism, although we humans are proscribed by the uncertainty principle from ever being able to predict the exact outcome of events, those events are predetermined nevertheless. In a holistic universe, everything is intimately and instantaneously connected to every event past and future, here on earth and far out in space, with no room for chance or choice.

Conclusion

The overwhelming weight of evidence, from seven decades of experimentation, shows not a hint of a violation of reductionist, local, discrete, non-superluminal, non-holistic

relativity and quantum mechanics—with no fundamental involvement of human consciousness other than in our own subjective perception of whatever reality is out there. Of course our thinking processes have a strong influence on what we perceive. But to say that what we perceive therefore determines, or even controls, what is out there is without rational foundation. The world would be a far different place for all of us if it was just all in our heads—if we really could make our own reality as the mystics believe. The fact that the world rarely is what we want it to be is the best evidence that we have little to say about it. The myth of quantum consciousness should take its place along with gods, unicorns, and dragons as yet another product of the fantasies of people unwilling to accept what science, reason, and their own eyes tell them about the world.

This is a greatly revised and updated version of an article first published in *The Humanist*, May / June 1992, Vol. 53, Number 3, pp. 13-15.

References and Notes

1. Lanza, Robert. The Wise Science. *The Humanist* 1992; Nov / Dec., 24-26.

2. Capra, Fritjof. *The Tao of Physics*. Boulder: Shambhala, 1975.
3. Ferguson, Marilyn. *The Aquarian Conspiracy: Personal and Social Transformation in the 1980s*. Los Angeles: Tarcher, 1980.
4. Zukav, Gary. *The Dancing Wu Li Masters: An Overview of the New Physics*. New York: Morrow, 1979.
5. Chopra, Deepak. *Quantum Healing: Exploring the Frontiers of Mind/Body Medicine*. New York: Bantam, 1989.
6. Chopra, Deepak. *Ageless Body, Timeless Mind: The Quantum Alternative to Growing Old*. New York: Random House, 1993.
7. Patricia Newton, talk before the 98th Annual Meeting of the National Medical Association, San Antonio, Texas, 1993. Quotation provided by Bernard Ortiz de Montellano (private communication).
8. For a history of the idea of the aether, see Cushing, J. and E. McMullin, eds. *Philosophical Consequences of the Quantum Theory: Reflections on Bell's Theorem*. Notre Dame, Indiana: University of Notre Dame Press, 1989; 272-311.

9. For more details, see Stenger, Victor J. Bioenergetic Fields. *The Scientific Review of Alternative Medicine* 3(1) 1999; 16-21.

10. For a fuller discussion on the empirical evidence for psychic phenomena and references, see Stenger, Victor J. *Physics and Psychics: The Search for a World Beyond the Senses*. Amherst NY: Prometheus Books, 1990. For an update, see Stenger Victor J. *Has Science Found God? The Latest Results in the Search for Purpose in the Universe*. Amherst NY: Prometheus Books, 2002.

11. Lodge, Sir Oliver. *Beyond Physics* . London: Alana and Unwin, 1920.

12. Lodge, Sir Oliver. *Continuity. The Presidential Address to the British Association for the Advancement of Science, 1913*. New York: Putnam, 1914; 21.

13. Zohar, Danah. *The Quantum Self. Human Nature and Consciousness Defined by the New Physics*. New York: Morrow, 1990; 225.

14. Einstein, A., B. Podolsky, and N. Rosen. Can the Quantum Mechanical Description of Physical Reality Be Considered Complete? *Physical Review* 47, 1935; 777.

15. Bell, J. S. On the Einstein-Podolsky-Rosen Paradox. *Physics* 1, 1964; 195.

16. Bohm, David. A Suggested Interpretation of Quantum Theory in Terms of "Hidden Variables," I and II. *Physical Review* 85, 1952;166.

17. Aspect, Alain, Phillipe Grangier, and Roger Gerard. Experimental Realization of the Einstein-Podolsky-Rosen *Gedankenexperiment*: A New Violation of Bell's Inequalities. *Physical Review Letters* 49, 1982; 91; Experimental Tests of Bell's Inequalities Using Time-Varying Analyzers, *Physical Review Letters* 49, 1982; 1804.

18. For more discussion see Stenger, Victor J. *The Unconscious Quantum: Metaphysics in Modern Physics and Cosmology*. Amherst, NY: Prometheus Books, 1995 and Stenger, Victor J. *Timeless Reality: Symmetry, Simplicity, and Multiple Universes*, Amherst, N.Y.: Prometheus Books, 2000.

19. See, for example, Talbot, Michael. *The Holographic Universe*. New York: Harper Collins, 1991.

20. Kafatos, Menas and Robert Nadeau. *The Conscious Universe: Part and Whole in Modern Physical Theory*. New York, Springer-Verlag, 1990 ; 124.